

CHARGE NUMBER: 0307  
PROJECT TITLE: Measurements Development  
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PERIOD COVERED: September, 1985  
DATE OF REPORT: October 8, 1985

## I. Mathematical Modelling

### Objective:

To maintain the tobacco models for filling power and cigarette firmness by incorporating new materials and measurement methods, conducting related studies of physical properties, and providing predictions based on the models.

### Status:

Initial work was completed on a computer spreadsheet version of the cigarette and tobacco modelling system. A preliminary system is now operational on an IBM PC using the Symphony program from Lotus. Blend formulas and independent parameters can be entered into the spreadsheet and tobacco and cigarette properties are calculated.

### Plans:

Additional features will be added to the spreadsheet system to make it easier for the casual computer user to use. When completed, the system will be documented.

## II. Moisture Measurement

### Objective:

To evaluate new or improved methods for the measurement of moisture in filler and cigarettes.

### Status:

Comparison runs were completed with two ovens set up comparably using the new air flow measurement technique. A combination of previously developed baffles from QA and additional modifications was used to result in approximately equal air flows on the top and bottom shelves. Results from the test were promising, as the shelf-to-shelf difference was eliminated. Several runs were required to show that the ovens were not statistically different from one another. At this point, the work has progressed to where the run-to-run variation inherent in the test is significant, requiring multiple runs. Again, all of the significant differences encountered in the test program can be attributed to air flow differences.

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To demonstrate the setup procedures, an oven from the BL plant was obtained that had been taken out of service because of poor performance. Checkout of the oven revealed numerous problems. A caramel-colored liquid was soaking the oven insulation, which was causing large temperature differences within the oven. The liquid was analyzed and found to be composed of BL-type materials. The source of the liquid is being investigated. In addition, air flows were significantly higher than in typical ovens (above 200 fpm on the top shelf compared to 150 fpm). These problems are being corrected, including reinsulation of the oven.

A new oven, sold by American Scientific and made in Japan, was received for evaluation. The oven is quite large, but includes some interesting features in the control system. Testing is being planned to evaluate the oven.

Plans:

Upon correction of the BL plant oven, samples will be tested for comparison with other ovens. The repair procedure will also be documented so that BL plant personnel can inspect their other ovens.

### III. Materials Evaluation Facility

Objective:

To provide physical testing services (CV, OV, firmness, loose ends, etc.) to groups inside and outside R&D.

Status:

A quotation was received from Honeywell to install a new Direct Digital Control (DDC) system in the lab. This system would permit multiple RH sensors, sensor calibration, and logging of conditions. The quotation is under review.

Upgrades to the original two CV-OV systems in the lab to eliminate obsolete equipment were completed. In addition, the new compacimeters were received from FTR. These new instruments are microprocessor controlled and are much easier to use than the older models.

A number of alternatives were investigated for the new weight selector. Official word was received from Hauni that they have discontinued their instrument. An instrument from SODIM in France was studied but was rejected because of the potential service problems, since SODIM is not represented in the U.S. A third device, from Filtrona, was rejected as not meeting our requirements. As a result, it appears that we will have to construct our own instrument.

Plans:

The Honeywell proposal will be reviewed with the Development and Plant Engineering groups for their input. Program development will begin for a PC-based workstation for the new compacimeters. Paperwork for a new weight selector will be initiated.

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